



Biotech

Research solutions for biotech companies

Get the expertise, support, and tools you need to realize your vision



Accelerate your journey with technical expertise, support, and tools

Your pioneering solutions will transform lives and improve humanity. To successfully navigate the path from discovery, to development, and to commercialization requires trusted allies. With a portfolio of solutions that span your drug development workflow, Thermo Fisher Scientific brings scientific and technological expertise to advance customer outcomes. Our network of validated processes and innovative solutions is rooted in empirical data and designed to help you confidently deliver transformative therapies to those who depend on them. With Thermo Fisher as your ally, you can develop, grow, and succeed to benefit humankind.

Successfully navigate the path to commercialization



Discovery

From creating research space infrastructure to advanced technologies and custom scientific services, we enable innovation while seeking to bridge discovery research to translational science.



Development

Leverage our tools, services, and deep industry expertise to accelerate candidates, develop efficient and scalable processes, lower regulatory and QC hurdles, manage risk, and successfully prepare for clinical trials.



Clinical trials

Our exceptional commitment to delivering high-quality, end-to-end global clinical supply chain services from phases 1 to 3 can help you prepare for commercial launch with the right tools at the right time.



Commercialization

When your product is ready for market, our comprehensive products and services can support the most demanding requirements—whether you opt for in-house or outsourced manufacturing.

Contents

Biotech	4
Expertise, support, and tools	
<hr/>	
Therapeutics development	14
Cell therapy	
Gene therapy	
Immunotherapy	
Small molecules	
Biologics	
Vaccines	
<hr/>	
Diagnostics development	28
Molecular diagnostics	
<hr/>	
Solutions for service providers	32
Contract research organizations	
Contract development and manufacturing organizations	
<hr/>	
Services and support for instruments	36
<hr/>	
Resources	39



Expertise

Navigate challenges so you can meet your goals on time

We provide technical support for every step of your workflow. Our specialists apply their deep technical knowledge to help address your challenges so that you can meet your goals on time and within budget. We work with you to keep you up to date on the latest innovations, install your instruments, and provide post-sale support both in person and remotely.

- Tailored demos, workflows, and solutions that will meet your unique goals
- Scientific and applications support in the field and on site to get you started quickly and easily
- Remote and in-person technical support to minimize downtime
- On-demand, virtual, and face-to-face training to equip you with the knowledge you need to advance



Quality

Helping ensure you get it right the first time

Quality is inherent in all that we do. Through continual improvement, validation, qualification services, and compliance with global regulations and standards, our high-quality solutions and services produce results you can trust.

- cGMP-compliant solutions help ensure consistent and reliable results
- Instrument calibration services help keep your equipment running accurately and in optimal condition
- Services to ensure compliance of your lab equipment and analytical instrumentation with GLP/GMP, GxP, 21 CFR Part 11, ISO, and other key regulations minimize the risk of failed audits for your critical instruments and laboratory equipment
- Traceable documentation (e.g., Certificate of Analysis) helps ensure quality and confidence in results
- Stringent quality management systems in our manufacturing sites (e.g., ISO 9001, ISO 13485, GMP, FDA registration) help ensure we meet the quality standards you expect



Productivity

Stay focused on the science and meet your milestones faster

Managing your inventory, ordering, and instruments takes up valuable time and resources. We have a range of robust productivity solutions that will simplify and strengthen these processes for you, so you have more time to focus on the science.

- The **thermofisher.com** website and our eProcurement connections make online ordering quick and simple, whether you're remote or in the lab, for single or multiple users
- On-site stocking through the Supply Center by Thermo Fisher Scientific ensures that products are available in your labs when you need them
- Cloud-based analysis solutions enable you to access, share, manage, and analyze your data quickly and securely even if you're not in the lab
- Smart instrumentation and remote services minimize any instrument downtime and keep your lab running
- Automation options for our instrumentation mean you can scale up quickly and easily



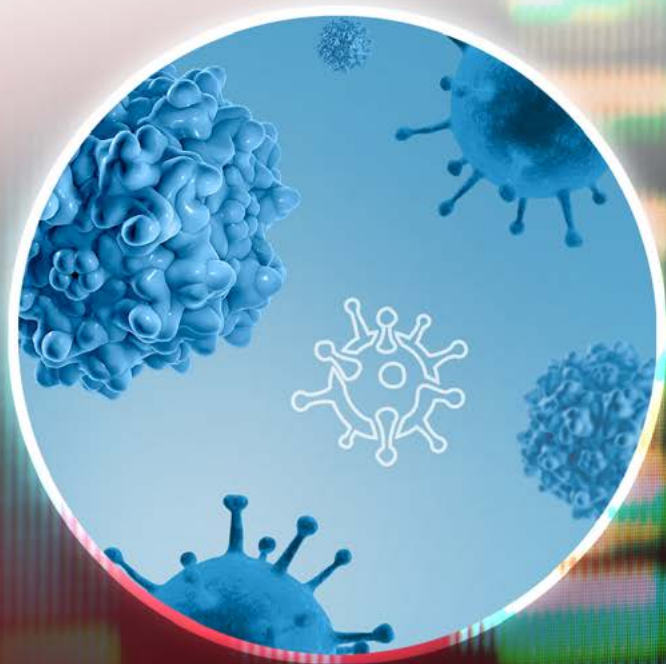


Innovation

Fueling your innovation with solutions that help you remain competitive

Our cutting-edge technologies, analytical instruments, and diagnostics enable you to push the boundaries of innovation.

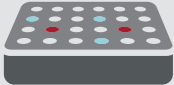
- Industry-leading R&D investment of \$1B annually and 5,700 scientists and engineers provide you with access to the latest technologies that will help you to move faster and more efficiently; investment areas include cell and gene therapy, precision medicine, material sciences, immuno-oncology, structural biology, and molecular diagnostics
- Collaborations with industry-leading customers and key opinion leaders help ensure that innovations are customer-centric and solve your complex challenges
- Our global scale enables unmatched capabilities in key scientific areas like precision medicine, so you can streamline your workflow and save time with solutions that work seamlessly together




Science at scale

Our solutions enable more from less and scale with you toward commercialization. Our goal is to help you improve data quality, increase reproducibility, and shorten time to results. These tools help increase productivity of individual scientists and enable you to generate superior results within an expected timeline. Please find some of our featured solutions below.


Sample processing



Multiwell plate format solutions




Processing more samples in shorter times

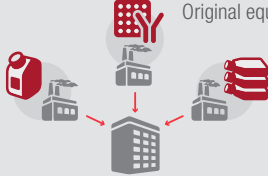


Thermo Scientific™ KingFisher™ Purification Systems


Product development



Solutions that meet regulations



Original equipment manufacturer




Commercial supply

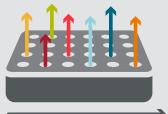


Solutions that enable you to scale toward commercialization

Multiplexing




Solutions to simultaneously detect multiple targets of interest in a single sample




Solutions to detect results from multiple samples in a single run

Data management



Data analysis and storage solutions



Cloud-based apps coupled with software and instruments with remote access

Sample processing at scale

Enhance your productivity and generate superior outcomes with advanced, high-throughput solutions.

Outsourcing



Sample isolation and quantification

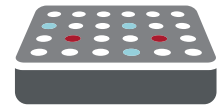
- **KingFisher Purification Systems**—Semi-automated or fully automated purification systems for extracting 24 or 96 samples per run of DNA, RNA, protein, or cells. Get more done in less time by using **Applied Biosystems™ MagMAX™ nucleic acid isolation kits** and reagents on KingFisher systems. These kits have been optimized for use on these instruments and have fully automated protocols.



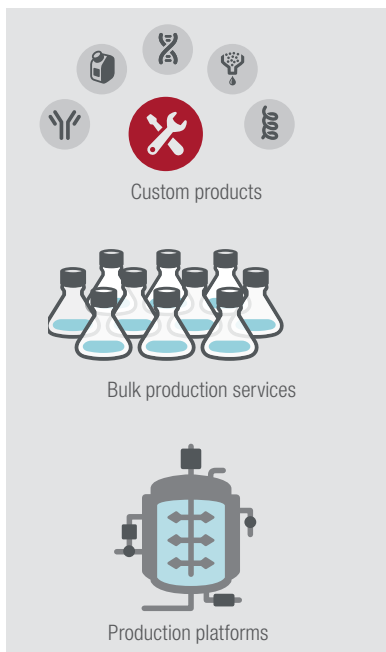
- **Invitrogen™ Dynabeads™ Magnetic Beads**—KingFisher instruments with Dynabeads magnetic beads offer the best balance of high yield and reproducibility with low nonspecific binding, which is one reason they have become the gold standard for immunoprecipitation using magnetic beads.
- **Thermo Scientific™ Varioskan™ LUX Multimode Microplate Reader**—Get high-throughput DNA, RNA, and protein quantification by scanning 96-well and 384-well plates in 15 and 45 seconds, respectively, using different detection modes.
- **Applied Biosystems™ ProFlex™ PCR System**—Thermal cycler with ultimate flexibility and throughput, from 3 x 32-well block to dual 384-well for high-throughput screening needs.

Genetic analysis

- **Applied Biosystems™ 3730 DNA analyzers**—96- or 384-well, plate-based capillary electrophoresis instrument with integrated plate stacker for 48-hour uninterrupted runs.
- **Applied Biosystems™ TaqMan® array cards, plates, OpenArray™ technology**—96- or 384-well plates or cards pre-spotted with dried-down assays; deliver results in only 30–45 minutes.
- **Ion Torrent™ next-generation sequencing (NGS) systems**—Complementary, automated NGS solutions to support a broad range of applications and throughput needs.

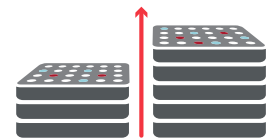


Production



Cell analysis

- **Invitrogen™ Attune™ NxT Flow Cytometer with Invitrogen™ CytKick™ Max Autosampler**—Process up to 21 plates (96-well) per day* with acoustic hydrodynamic focusing flow cytometry.
- **Thermo Scientific™ CellInsight™ CX7 LZR High-Content Screening Platform**—Scan a 96-well plate within 3.5 minutes in confocal setting and perform simultaneous image-to-data analysis.



Protein analysis

- **Thermo Scientific™ EasyPep™ 96 MS Sample Prep Kit**—Automation-compatible, 96-well, plate-based mass spectrometry sample preparation in less than 5 hours.
- **Higher-throughput western blotting solutions**—Separate, transfer, process, and quantitate up to 2 x 26 samples per run; walk-away processing saves about 10 repetitive hands-on steps over the course of 4 hours.

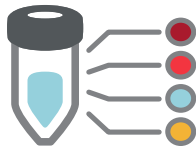
* Based on an 8-hour day under normal conditions.

Multiplexing options

Get the most out of your precious samples with multiplex platforms that offer data accuracy and reduced variability through simultaneous measurement. Our solutions detect multiple analytes from a single sample simultaneously and analyze multiple samples in a single run.

Genetic analysis

- **Applied Biosystems™ Clariom™ D Assay**—The most comprehensive coverage, detecting all known genes, exons, and splice variants for deep and broad transcriptome analysis and biomarker discovery—all from a minimum input of 50 ng RNA.
- **Applied Biosystems™ Clariom™ S Assay**—Detects constitutive exons—those exons expressed in all known, well-annotated transcript isoforms of genes for simple gene-level expression profiling, with a minimum input of 50 ng RNA.
- **Applied Biosystems™ GeneChip™ WT Pico Kit**—Detects from a minimum input of 0.01 ng RNA, or 0.5 ng for FFPE samples.
- **Applied Biosystems™ Platinum™ Multiplex PCR Master Mix**—Designed specifically for endpoint multiplex PCR with minimal optimization. Amplifies up to 20 amplicons in a single reaction.
- **Invitrogen™ QuantiGene™ Plex Gene Expression Assay**—Gene expression measurement directly from sample of up to 80 targets per sample.
- **Ion AmpliSeq™ and Ion Torrent™ Oncomine™ NGS assays**—Simple, versatile technology helps you target tens to hundreds of genes and sequence challenging samples with low-input requirements across mutation types.

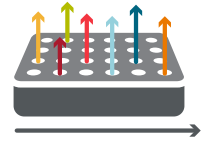


Cell analysis

- **Invitrogen™ EVOS™ M7000 Imaging System**—Acquisition in multiple fluorescence and transmitted light channels with a choice of more than 20 LED cubes.
- **Attune NxT Flow Cytometer with panel builder**—Up to 14-color detection with free antibody panel design support tool.
- **Thermo Scientific™ CellInsight™ CX7 LZR High-Content Screening Platform**—7-color laser excitation for cell-level multiplex phenotyping.
- **Invitrogen™ flow cytometry antibodies, assays, and reagents**—Our comprehensive collection of antibodies, assays, beads, and buffers supports leading research areas.

Protein analysis

- **Invitrogen™ iBright™ FL1500 Imaging System**—Multichannel fluorescence multiplexing enables imaging up to 4 proteins or protein variants in a single western blot.
- **Thermo Scientific™ TMTpro™ 16plex Label Reagent**—Detecting 16 targets simultaneously results in analysis twice as fast as equivalent label-free mass spectrometry.
- **Invitrogen™ ProcartaPlex™ multiplex immunoassays**—Measure up to 65 protein targets from a single sample of as little as 25 µL in volume.



Data management at scale

Easily manage your data and collaborate with partners across a spectrum of platforms with secure, cloud-based instrumentation and software.

Cloud-based apps and software, and instruments with remote access

- Instruments with simple and intuitive software can be used to analyze data away from the bench. Software integration with the Connect cloud-based platform provides a convenient, centralized analysis and data management solution, enabling you to find more biological information in your data.



Data storage and management solutions

- Connect provides secure, cloud-based data storage, scientific analysis apps, and peer collaboration tools, creating bold new efficiencies in the lab.

Production at scale

Drive performance and achieve optimal bioprocessing outcomes, regardless of batch size, with our custom services.

Custom antibody development

- The Thermo Fisher Scientific custom antibody service offers customized production, purification, and conjugation of polyclonal, monoclonal, recombinant, and flow antibodies.

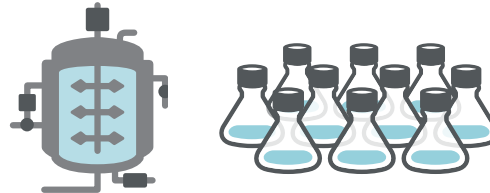
Gibco™ custom cell culture media

- We are committed to meeting your toughest challenges with high-performing Gibco™ products and services customized to your research and production needs.



Single-use bioprocessing

- Single-use technologies have been proven to be robust and scalable from lab/scale-up to cGMP production applications, including bioprocessing equipment and automation, flexible containment, and rigid containment product portfolios.



Outsourcing opportunities

Increase efficiency by partnering with experienced professionals and remove inhibitions associated with acquiring new skills and instrumentation. Our wide range of service capabilities leverages a diverse portfolio of quality and consistency, built by some of the most recognized life science brands in the industry, including the Applied Biosystems™, Invitrogen™, and Gibco™ brands. Find out more on [page 12](#).

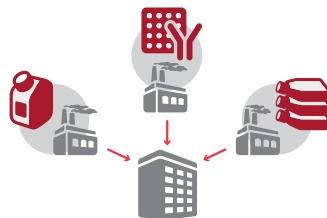


Pipeline acceleration and support

Ease your transition across the entire product development pipeline with access to commercial-use rights, assurance of best-input materials, and proven quality standards to achieve regulatory compliance.

Gibco™ Cell Therapy Systems (CTS™) products

- GMP manufactured CTS products have cell and gene therapy-specific intended use statements, extensive safety testing, and proactive regulatory documentation for clinical cell therapy and immunotherapy research and manufacturing.



Commercial supply team

- Our experienced team can support you in the commercial development of molecular diagnostics, immunodiagnostics, therapeutics, and life science products. Partner with us for the quality, security of supply, customization, and expertise you need to enable the development and commercialization of your products or services. Find out more on [page 13](#).



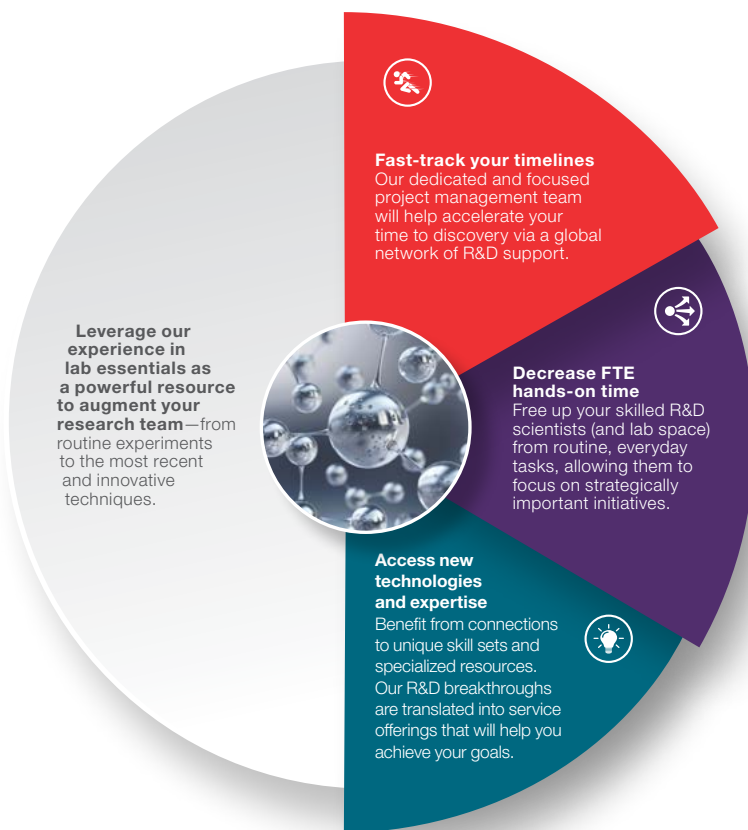
Instruments with software that assists in 21 CFR Part 11 compliance

- Software supports compliance with 21 CFR Part 11 FDA guidelines on electronic records security, and prevents unauthorized access to the instrument.

Accelerate your timelines by outsourcing research projects to Thermo Fisher Scientific

We provide specialized, reliable, high-quality outsourcing solutions for customers who don't have the capacity, time, or resources to handle a project in-house.

- **Optimize your workflow with new technologies** by accessing the expansive technological expertise of the R&D scientists who developed our kits.
- **Expedite your research and development** by accessing our robust global network of lab spaces engaged in cutting-edge innovation.
- **Minimize risk in your pipeline** by placing your projects with our team of dedicated scientific project managers that ensure quality and on-track delivery.



We can tailor workflows for all research projects, including:

- **Vaccines**—gene to protein, cell line production, immunoassays, custom peptides, and custom antibody production
- **Small molecules**—assay and cellular assay technologies, biochemical and cell-based profiling, loss-of-function screening, genome editing, library screening, drug metabolism and drug safety, oligonucleotides, microarray analysis
- **Immunotherapy**—immunoassays, custom antibody production, custom peptides
- **Gene therapy**—loss-of-function screening, stem cell services, genome editing
- **Cell therapy**—stem cell services, cell line characterization, genome editing
- **Biologics**—gene to protein, cell line production, immunoassays, custom peptides, genome editing
- **Biomarkers**—loss-of-function screening, custom peptides, immunoassays, custom antibody production, transcriptome profiling, genotyping analysis

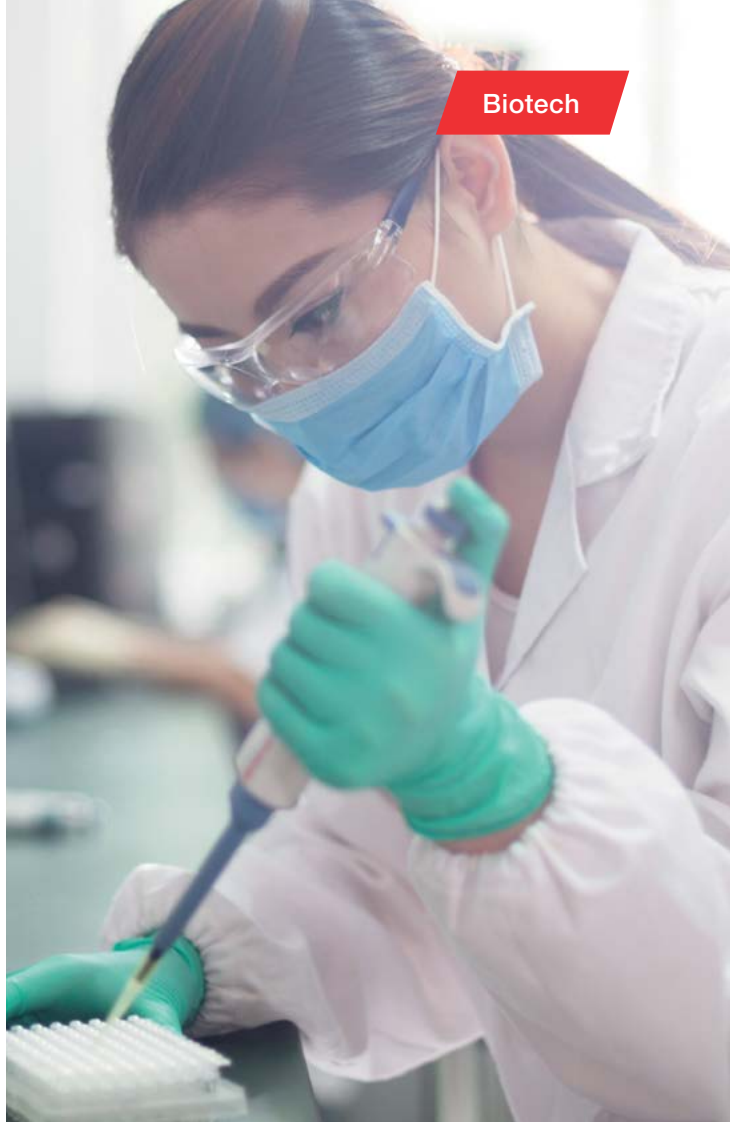
Find out more at thermofisher.com/customservices

Enable commercialization with custom manufacturing and commercial supply services

As the world's leading supplier of reagents and instruments for molecular biology, cellular imaging, synthetic biology, and protein sciences, we also offer the most comprehensive technology and product portfolio for use by companies in developing next-generation molecular testing and immunodetection assays. Leverage our superior combination of quality, global distribution, and commercial services and support so you can maximize your efficiency and scale while minimizing risk, and bring your product to market faster.

Accelerate your assay development and kit manufacturing

Creating a high-performing, competitively positioned assay is demanding and challenging. We understand this challenge from our work with leading biotech companies who face many of the same difficulties you do. By choosing us, you gain more than just a partner—you'll have an experienced team committed to your success at every stage of the product development and commercialization process.



Commercial supply capabilities

Customization

From assay design to workflow optimization—whatever your needs, our custom services team is there for you, including:

- Custom format and formulation with in-process testing
- Custom functional testing (e.g., bridging studies, verification testing, stability studies)
- Packaging, labeling, and kit production
- Lyophilization

Superior quality

Don't cut corners when it comes to quality. Bring your vision into being in our state-of-the-art manufacturing sites. Your product will be subjected to rigorous testing to ensure lot-to-lot consistency and reproducibility with the following compliance:

- Certified quality systems with ISO 9001, ISO 13485, and ISO 14001 status
- Six Sigma and Lean Manufacturing processes
- Manufacturing and filling within facilities that meet 100,000 (class D) clean room standards

Robust security of supply

Partnering with us will help ensure the security of your raw material supply. We have strong safeguards in place to help you reduce risk and avoid delays and setbacks in manufacturing, including:

- Advanced change control notifications
- A global manufacturing footprint
- Comprehensive controls over raw materials and processes
- Confidentiality

Find out more at [thermofisher.com/oem](https://www.thermofisher.com/oem)





Therapeutics development

Your partner for every
step in your therapeutics
development journey

No other partner to the biotech industry can support the rapid, end-to-end development of a therapeutic like Thermo Fisher Scientific.

From discovery to commercialization, our innovative and flexible tools, scalable solutions, and custom services help accelerate your success.

thermofisher.com/biotechtherapeutics

Cell therapy development

Your work holds the potential to deliver life-changing treatments. Our mission is to help you succeed by providing high-quality materials, services, and support to help you translate your cell therapy from discovery to clinical research and commercial manufacturing.

Solutions to support gene-modified cell therapy development, every step of the way



Cell isolation	Cell engineering	Cell culture and expansion	Profiling and selection	Wash, fill, and finish
<ul style="list-style-type: none"> • Sample prep and cell isolation • Cell activation (if applicable) • Evaluation of activation 	<ul style="list-style-type: none"> • Genome editing • Transfection • Validation of genome editing (Sanger sequencing, qPCR, dPCR) • RNAi 	<ul style="list-style-type: none"> • Media, sera, and supplements • Automated cell counting 	<ul style="list-style-type: none"> • Functional analysis • Genomic stability and safety 	<ul style="list-style-type: none"> • Wash buffers • Cryopreservation • Cryogenic storage and logistics
<ul style="list-style-type: none"> • A path for regulatory compliance • Processing samples easily, quickly, and accurately with walk-away automation 	<ul style="list-style-type: none"> • High editing efficiency, accuracy, and specificity • High transfection efficiency and throughput • Manufacturing according to ISO standards • The use of validated protocols 	<ul style="list-style-type: none"> • Higher cell survival rates • Flexible culture conditions • Compatibility with regulatory guidelines • High potency 	<ul style="list-style-type: none"> • High throughput, speed, and automation • Accuracy 	<ul style="list-style-type: none"> • High reliability • Flexibility by customization

See the full range of cell therapy solutions at thermofisher.com/celltherapy







See the full range of CTS products at thermofisher.com/cts

Products for Cell Therapy Systems: a proven choice for clinical cell therapy manufacturing

As you move your research toward the clinic, high-quality products and proper documentation are essential to getting it right the first time. We offer a broad array of high-quality Cell Therapy Systems (CTS) products, including media, reagents, enzymes, selection beads, and devices, which are designed for use in cell therapy research applications and are manufactured in conformity with GMP for medical devices, 21 CFR Part 820, following USP <1043> and Ph Eur 5.2.12, at sites that are FDA-registered and ISO 13485–certified and regularly audited.

When you choose CTS products, you can expect:

- | | | |
|---|---|--|
|  <p>cGMP-compliant documentation</p> <ul style="list-style-type: none"> • Traceability documentation that may include Certificates of Analysis, Certificates of Origin, Drug Master Files (DMF), and Regulatory Support Files (RSF) • Helps reduce time in preparing investigational new drug (IND) submission • All products are ready to be used as part of your IND—ready for chemistry, manufacturing, and controls (CMC) • CTS product labeling and intended use statements |  <p>Seamless transition from research to clinic</p> <ul style="list-style-type: none"> • Defined formulations minimize lot-to-lot variability • Manufactured under scalable cGMP conditions • Complementary RUO products • Extensive quality assurance (QA) testing for sterility, endotoxins, adventitious agents, and mycoplasmas in media and reagents |  <p>Expert consultation</p> <ul style="list-style-type: none"> • Regional technical support for all CTS products • Experienced professionals to help navigate regulatory processes from research to commercial phase • Cell therapy experts to help answer all of your questions • Backed by more than 50 years of Gibco™ media experience |
|---|---|--|





Gene therapy development

Gene therapy research holds great promise for treating a wide range of diseases that were once thought untreatable. Explore our portfolio of high-quality gene therapy products and services to discover the tools you need to move your project from research to clinical trials and commercial gene therapy manufacturing.

Solutions to support gene therapy development

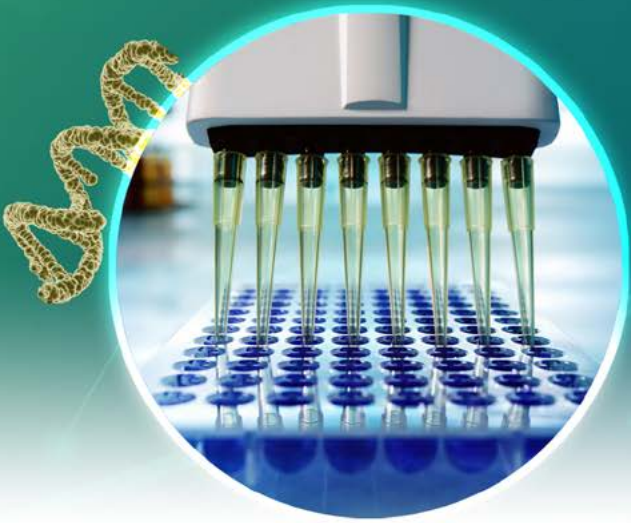


Solutions

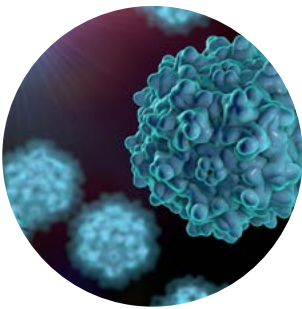
Vector construction	Vector production	Vector purification	Profiling and selection
<ul style="list-style-type: none"> • Gene synthesis • Cloning and assembly • Large-scale plasmid production and purification • Nucleic acid quantification • Vector verification and Sanger sequencing 	<ul style="list-style-type: none"> • Viral vector production* and services • Flow cytometry for titer check • Single-use technologies and bioreactors for scaled-up production • Specialized laboratory equipment • Cell culture plastics • Automated cell counting <p>* CTS products and RUO version available.</p>	<ul style="list-style-type: none"> • Chromatography • Host-cell residual DNA quantitation • Contamination testing 	<ul style="list-style-type: none"> • Immunoassays • Flow cytometry • Imaging • High-content analysis and assays • Mass spectrometry and assays • Western blot analysis • NGS • Microarray analysis • Genomic stability and safety testing • qPCR
<ul style="list-style-type: none"> • Time and overhead savings by use of outsourced services • High cloning efficiency • High-yield purification 	<ul style="list-style-type: none"> • High yields and specificity • A path for regulatory compliance • Efficient scale-up solutions 	<ul style="list-style-type: none"> • Flexibility of multiple purification options to meet specific needs 	<ul style="list-style-type: none"> • High throughput, speed, and automation • Accuracy



We enable

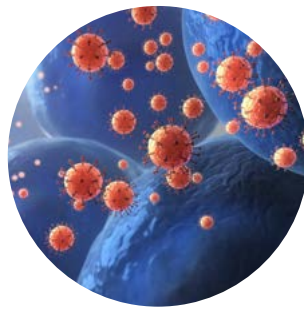


Innovations designed to accelerate your development of gene-modified gene therapies



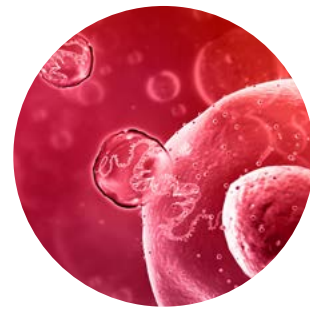
Adeno-associated virus

Our industry-leading and scalable solutions for adeno-associated virus (AAV) vector development can help you throughout your AAV manufacturing process, whether you need equipment, consumables, contract development and manufacturing organization (CDMO) services, or field applications support. Additionally, we take great measures to provide assurance of supply for our products to help you advance your program from the lab through commercial manufacturing.



Lentivirus

Cost-effective lentiviral (LV) vector production is critical to meeting commercial demand, and a smooth scale-up to clinical production is essential. To address these needs, we have optimized solutions to help reduce production costs and streamline your transition from gene therapy research to clinical scale.



Nucleic acid therapeutics development

Accelerate your nucleic acid-based therapeutic drug discovery, development, and commercialization when you partner with the Thermo Fisher RNA therapeutics supply team. You'll gain access to innovative platform technologies, technical expertise for RNA therapeutics, manufacturing scale, and customized solutions for your entire workflow—from compound synthesis, purification, and analysis to formulation and delivery.

Discover the full range of solutions at [thermofisher.com/genetherapy](https://www.thermofisher.com/genetherapy)

Immunotherapy development

With the recent surge of T cell–based immunotherapies, more researchers are taking an interest in these specialized immune cells, particularly with respect to the development of chimeric antigen receptor T cell (CAR T) therapies.

Our solutions are for development research for cell therapy, gene therapy, immune checkpoint inhibitor therapy, and cancer vaccine development.

To find out more, go to thermofisher.com/biotechimmunotx

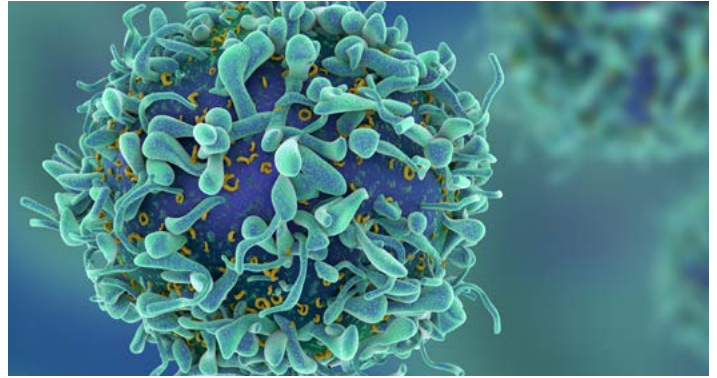


Cell-based immunotherapy

Whether you're developing a CAR T therapy, another type of T cell immunotherapy, or working with other immune cell types, we can help you move from research to the clinic and beyond.

Immunotherapy workflow from isolation to characterization

We have an extensive selection of high-quality, RUO products to support your early cell therapy development. As you move toward clinical and commercial applications, our GMP-manufactured CTS products offer specific cell- and gene-therapy use statements, extensive safety testing, and proactive regulatory documentation.



Cell isolation and activation

Gibco™ CTS™
Dynabeads™
magnetic beads for clinical applications and Invitrogen™
Dynabeads™
magnetic beads for Research Use Only experiments*



Cell engineering and gene transfer

Plasmid purification, transfection reagents, lentiviral transduction, electroporation, and gene editing tools



Cell culture

Gibco™ CTS™ GMP-manufactured media and reagents



Wash, fill, and finish

Critical-environment containers, and fluid and transfer solutions



Characterization and release testing

Gibco™ CTS™
Rotea™ Counterflow Centrifugation System for cell processing; assays for flow cytometry, qPCR, Invitrogen™ Luminex® instruments, NGS, and more

Discover the full range of solutions at thermofisher.com/immunotherapy

*The different antibody ratios and clones of the strictly RUO beads vs. beads meant for translational and clinical use can give different activation profiles. Thus, customers using the strictly RUO products should only have a research focus, while customers who want to take their procedure to clinical trials need to use the translational/clinical products to avoid revalidation of all of their assays when going to clinical use.





Small molecule drug development

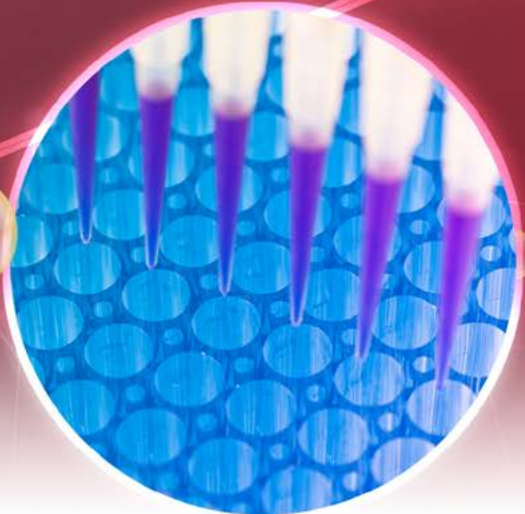
Small molecules are powerful therapeutic weapons that deliver tremendous health outcomes.

Solutions to support small molecule therapeutic development



Target discovery	Assay development and screening	Lead optimization	Toxicology studies
<p>Genetic analysis</p> <ul style="list-style-type: none"> Genome editing Microarrays NGS qPCR RNA interference <p>Protein analysis</p> <ul style="list-style-type: none"> Cryo-electron microscopy (Cryo-EM) Immunoassays Kinase assays Mass spectrometry Nuclear magnetic resonance (NMR) spectroscopy Protein-protein interaction 	<p>Cell-based analysis</p> <ul style="list-style-type: none"> Biochemical assays Cell function assays Flow cytometry High-content screening (HCS) 	<p>Cells and screening compound libraries</p> <ul style="list-style-type: none"> Cell model creation Screening compound libraries <p>Functional analysis</p> <ul style="list-style-type: none"> Biodistribution assays Cell function assays Cryo-EM Epigenetic tools HCS Pathway biology Reporter gene assays Robotic and lab automation platforms Screening and profiling services Target-based assays 	<ul style="list-style-type: none"> Custom organic synthesis Hit-to-lead building blocks
<ul style="list-style-type: none"> Finding of therapeutic targets Confirmation of therapeutic targets discovered by others 	<ul style="list-style-type: none"> Accurate and biologically relevant screening models Sensitive and robust assays High-throughput lab automation for efficiency 	<ul style="list-style-type: none"> Custom organic synthesis in ISO 9001:2000-certified facilities Building blocks with medically important ring systems 	<ul style="list-style-type: none"> Comprehensive <i>in vitro</i> hepatic systems Assays for metabolic and safety profiles of lead candidates





Hit milestones faster by getting to the data more quickly and easily

Rapidly discover and validate new therapeutic targets

- **Minimize the trial-and-error phase and get to answers faster** and with less effort with Invitrogen™ Genome Editing Technology Systems. Designed to work together, these optimized and validated systems are the only complete toolset for every step in your cell engineering workflow.
- **Rapidly perform deep and broad transcriptome analysis**, including coverage of novel noncoding transcripts and splice isoforms with Applied Biosystems™ Clariom™ D Assays. Even working with low-input RNA from precious or challenging samples such as FFPE tissue, you save time by moving quickly and confidently from sample to answer.
- **Simplify your sequencing on a broad range of applications** with Ion Torrent™ NGS systems and consumables. The flexible systems allow you to scale, automate, and operate at a broad range of throughput capacities alongside a broad range of plug-and-play consumables.

Simplify compound hit characterization

- **Put an end to the slow and complex quantitative analysis of cell populations** and obtain cutting-edge images and data quickly and easily. Thermo Scientific™ HCS platforms combine fluorescence imaging, image processing, and automated cellular measurements to provide exceptional resolution for high-throughput analysis.
- **Reduce compound interference** by applying TR-FRET technology with Invitrogen™ LanthaScreen™ kinase activity assays. This toolbox of “mix and match” reagents is designed to enable rapid assay configuration on multiple target classes and instrument platforms.
- **Generate expression data** for secondary compound library screening and hit profiling more quickly and economically with the Applied Biosystems™ Clariom™ GO Screen Assay. Developed in partnership with pharmaceutical industry leaders, the 384-format microarray solution provides a high-throughput, low-cost method to directly measure the expression of ~20,000 genes.

Confidently validate compound safety

- **Get more physiologically relevant results** with Gibco™ 2D and 3D hepatic systems, subcellular fractions, and transport systems. Our team of product specialists is on hand to offer support and application knowledge relating to your compound and any drug metabolism and pharmacokinetics (DMPK), ADME, and induction research.
- **Streamline toxicity studies** with Applied Biosystems™ TaqMan® Assays. Our technology is the gold standard of performance, quality, and content for gene expression analysis by qPCR, developed using long-standing bioinformatic expertise in primer and probe design and stringent testing across applications and integrated platforms.
- **Drive deeper scientific insights into complex disease susceptibility**, pharmacogenomics, and genetic factors in diverse populations to advance population genomics studies. The Applied Biosystems™ Axiom™ Precision Medicine Diversity Research Array is a comprehensive, imputation-aware genotyping resource with >850,000 markers selected for high genomic coverage.

Discover the full range of solutions at [thermofisher.com/biotechmolecules](https://www.thermofisher.com/biotechmolecules)

Biologics development

The expansion of personalized medicine has also had an impact on drugs' evolutionary timelines. Biologics, such as monoclonal antibodies, are advancing swiftly. Partner with us for access to tools that enhance your innovation.

Solutions to support therapeutic antibody development



Target discovery	Antibody generation and engineering	Antibody characterization	Bioproduction and process development
<p>Genetic analysis</p> <ul style="list-style-type: none"> Genome editing Immune repertoire assays qPCR RNA interference RNA sequencing <p>Protein analysis</p> <ul style="list-style-type: none"> Cryo-EM Immunoassays Mass spectrometry Protein-protein interaction <p>Cell-based analysis</p> <ul style="list-style-type: none"> Cell function assays Cell model creation Flow cytometry Regulatory T cells (Treg) analysis 	<p>Antigen production</p> <ul style="list-style-type: none"> Custom gene synthesis Custom peptide synthesis Protein expression <p>Antibody lead discovery and generation</p> <ul style="list-style-type: none"> Carrier protein immunogens and adjuvants HCS Phage display systems Protein expression platforms Serum-free hybridoma media <p>Antibody engineering</p> <ul style="list-style-type: none"> Gene synthesis for antibody DNA variant libraries 	<p>Biological characterization</p> <ul style="list-style-type: none"> Biodistribution assays Cell function assays Immune response analysis by flow cytometry Immunoassays <p>Biophysical characterization</p> <ul style="list-style-type: none"> Charge variant analysis Mass spectrometry Peptide mapping Protein or peptide quantitation Size heterogeneity analysis 	<p>Stable cell line and bioreactor production</p> <ul style="list-style-type: none"> Stable cell line development Cell culture media development and optimization Bioreactor systems <p>Purification</p> <ul style="list-style-type: none"> Affinity chromatography resins Bioprocess resins Hydrophobic interaction chromatography <p>Impurity and contamination testing</p> <ul style="list-style-type: none"> Adventitious virus testing Magnetic bead-based sample preparation Microbial identification Mycoplasma detection Peptide quantitation Residual host-cell DNA quantitation Size exclusion chromatography-high performance liquid chromatography (SEC-HPLC) purity testing
<ul style="list-style-type: none"> Cost-effective, comprehensive, and scalable solutions Standard and customizable solutions Speedy transitions from research to clinic and large-scale production 			



See the full range of solutions at thermofisher.com/biotechbiologics



Innovations designed to accelerate your development of antibody-based therapies

Cost-effective solutions to increase productivity and speed

- Obtain customized DNA constructs with 100% sequence accuracy with Invitrogen™ GeneArt™ Gene Synthesis.
- Isolate advanced transfection-grade plasmid DNA in about half the time of current standard protocols with Invitrogen™ PureLink™ Expi Endotoxin-Free Plasmid Purification Kits.
- Rapidly produce high amounts of protein in less time and at a lower cost with Gibco™ Transient Protein Expression Systems.

Reliable solutions to characterize and optimize antibody candidates

- Multiplex up to 65 targets per sample for faster time-to-data with lower sample consumption with Invitrogen™ ProcartaPlex™ Immunoassays.
- Increase your flow cytometry efficiency and flexibility with the Attune NxT Flow Cytometer with CytKick Max Autosampler. It is up to 10 times faster, has up to 14 colors, doesn't clog with difficult samples, and offers walk-away automation.

Customizable and scalable solutions toward commercialization

- Scale up your process or product development pipeline with bulk quantities of high-quality immunoassay reagents and biochemicals.
- Get ultimate flexibility for your most complex processes with Gibco custom cell culture media that is customized to your research and production needs.
- Help reduce risk and improve operational efficiencies from lab/scale-up to cGMP production applications with Thermo Scientific™ HyPerforma™ Single-Use Bioreactors (S.U.Bs).



Vaccines development

Vaccines harness the power of the immune system to fight disease. Your vaccine research and development efforts can improve health outcomes and prevent pandemics. Our team and products support vaccine research, regardless of approach, enabling the speed and accuracy needed to shorten your development time.

Solutions to support vaccine development



Solutions

Target discovery	Candidate vaccine synthesis and functional analysis	Production process development
<p>Pathogen characterization</p> <ul style="list-style-type: none"> • Pathogen DNA and/or RNA isolation • Pathogen DNA and/or RNA sequencing solutions • Pathogen protein expression and analysis • Pathogen proteomic and metabolomic analysis <p>Host–pathogen interactions and host response</p> <ul style="list-style-type: none"> • Flow cytometry • HCS • Immunoassays • Mass spectrometry • NGS • qPCR • Receptors and other entry factors • Tracking internalization • Virus neutralization 	<p>Candidate vaccine synthesis</p> <ul style="list-style-type: none"> • Attenuated vaccines • Nucleic acid vaccines • Protein subunit vaccines <p>Functional analysis</p> <ul style="list-style-type: none"> • Biodistribution assays • Cell function assays • Cell model creation • Flow cytometry • HCS • Immunoassays • Mass spectrometry 	<p>Production and purification for scaling up</p> <ul style="list-style-type: none"> • Scale-up vaccine production technologies • mRNA vaccine production and purification <p>Impurity and contamination testing</p> <ul style="list-style-type: none"> • Adventitious virus testing • Magnetic bead–based sample preparation • Microbial identification • Mycoplasma detection • Protein quantitation • Residual host-cell DNA quantitation • Residual plasmid quantitation • SEC-HPLC purity testing
<ul style="list-style-type: none"> • Speed, accuracy, and support • Maximization of screening throughput of vaccine targets 	<ul style="list-style-type: none"> • Cost-effective and scalable solutions • Speedy transition from research to the clinic and large-scale production 	<ul style="list-style-type: none"> • Both standard and customizable solutions for a scalable and robust process



We enable



Progress through the first 3 phases of your journey with speed and accuracy

Q Quickly and accurately identify antigens that elicit a strong immune response

Our extensive range of highly sensitive products and scalable solutions is designed to support you from viral nucleic acid isolation to pathogen analysis and detection by qPCR, Sanger sequencing, and NGS. Our products enable speed and accuracy while maximizing screening input of vaccine targets.

thermofisher.com/targetdiscovery

🧪 Characterize and prepare high yields of high-quality pathogen components for preclinical testing

Our wide array of products can be used to develop various types of vaccines, including live-attenuated, inactivated, subunit, and genetic vaccines. Our scalable solutions render high quality and high yields of pathogen components needed to build your vaccine while helping you save time and money.

thermofisher.com/antigenidentificationandselection

⚙️ Build a scalable, robust, and highly controlled process for vaccine development for clinical trials

Our team can help identify materials, equipment, analytical methods, and process conditions to support both standard and customizable solutions for a scalable and robust vaccine development process.

thermofisher.com/processanddevelopment

See the full range of solutions at thermofisher.com/biotechvaccines



Diagnostics development

Supporting your success in the development of new diagnostics

Your work to develop innovative diagnostics that deliver answers as quickly and precisely as possible can lead to greatly improved health outcomes. Effective tests empower caregivers with the ability to assess risk and identify disease early, monitor the efficacy of treatments, and provide reliable prognoses. We have listened to your feedback, and we know you face a myriad of challenges on the journey from discovery to commercialization.

Our capabilities to help you navigate these challenges are unmatched. When you partner with Thermo Fisher to help enable development of new diagnostics, your success is our wholehearted purpose.



High-quality products



Cost-effective solutions



Innovative tools



Support across the workflow



Scalability as you grow

thermofisher.com/biotechdiagnostics

Molecular diagnostics

Take no chances in the effort to achieve your goals in molecular diagnostics. Partner with us for the quality, security of supply, customization, and expertise you can expect from Thermo Fisher Scientific.

Solutions to support molecular diagnostics development



Solutions

Sample collection	Nucleic acid isolation	Biomarker identification/discovery	Biomarker verification	Test development	Clinical validation, studies/trials, production
<ul style="list-style-type: none"> Whole-blood collection tubes Fractionation, stabilization, and extraction kits 	<ul style="list-style-type: none"> Nuclease-free lab bench preparation tools Nucleic acid isolation kits and instrumentation Magnets and mixers DNA, mRNA, and exosome isolation kits and reagents Nucleic acid quantification instruments and assays 	<ul style="list-style-type: none"> Microarray analysis assays and instruments Cytogenetics kits and reagents qPCR instruments, assays, and reagents NGS instruments, targeted sequencing assays, kits, and reagents Sanger sequencing systems 	<ul style="list-style-type: none"> qPCR instruments, assays, and reagents Branched DNA-based gene expression analysis Microarray analysis assays, instruments, and services NGS instruments, targeted sequencing assays, kits, and reagents Cell model creation—Invitrogen™ Cells-to-C_T™ kits, gene synthesis, thermal cyclers, cell culture plastics, transfection reagents, and characterization assays Cell based analysis—imaging, high-content analysis, and flow cytometry Protein analysis—immunoassays and western blot analysis 	<ul style="list-style-type: none"> qPCR instruments, assays, and reagents Cells-to-C_T kits QuantiGene gene expression assays NGS instruments, targeted sequencing assays, kits, and reagents 	<ul style="list-style-type: none"> qPCR instruments, assays, and reagents NGS instruments, targeted sequencing assays, kits, and reagents



We enable

<ul style="list-style-type: none"> Compatibility with clinically relevant samples Safe, simple sample collection Effective stabilization and preservation of nucleic acid 	<ul style="list-style-type: none"> Compatibility with clinically relevant samples High yields of high-quality nucleic acid Simple automation for increased sample throughput 	<ul style="list-style-type: none"> Comprehensive and accurate coverage for genomic and gene expression analysis Robust workflow for low-input and challenging samples Intuitive, actionable data analysis 	<ul style="list-style-type: none"> Highly accurate, flexible, and fast singleplex and multiplex options Customization of solutions to meet your specific needs A path for regulatory compliance 	<ul style="list-style-type: none"> A path to the clinic with IVD-cleared instruments Assay and instrument precision Customization of gene panels to meet your specific test needs 	<ul style="list-style-type: none"> A path to the clinic with IVD-cleared instruments
--	---	--	--	--	---

Discover the full range of solutions at [thermofisher.com/biotechdiagnostics](https://www.thermofisher.com/biotechdiagnostics)

Business models supporting each step of your business evolution

You will face challenges on your product development journey. Work with our commercial supply team and they will help you to overcome them so you can focus on your technology with confidence.

With our four state-of-the-art technology platforms for NGS and Sanger sequencing, and PCR and qPCR, we've helped our partners launch tests in a wide range of molecular applications, such as infectious diseases, animal health, reproductive health, and oncology. No matter what your application, throughput, turnaround time, or cost-per-sample needs, you can count on us to help you access the best reagents and instruments for your focus area.



Instrumentation

- Instrument placements
- Reagent rentals
- Private labels
- Leverage our global install base of instruments



Consumables

- OEM reagents and plastics for kits or services
- Bulk, custom, or private-label components



Services

- Custom manufacturing
- Lyophilization and kitting services
- Assay development and optimization services
- Licensing to exclusive IP





Solutions for service providers

Your ability to provide research, manufacturing, or testing services to your clients depends on your ability to meet their needs on time, in scope, and within budget. Your customer's timeline is essentially your own; so with your contract as your promise, you need to be confident that you can deliver on every commitment, every day.

Thermo Fisher can add advantages like:

-  cGMP-compliant manufacturing facilities to meet your regulatory and safety needs
-  Flexible and cost-effective solutions designed to consistently deliver high-quality results quickly
-  Scalable solutions that automate processes to save you time and resources
-  An unrivaled breadth of products and services to meet your needs
-  A legacy of experience and know-how to help build you the optimal workflow
-  Support, guidance, or help meeting any challenge you might face

No other industry partner can offer this full range of robust solutions.

thermofisher.com/biotechservices

Contract research organizations

Helping you meet your commitments every time

The support you provide to the pharmaceutical, biotech, and medical device industries is invaluable. Whether you're delivering preclinical, toxicology, laboratory analysis or biostatistics, clinical trials, dealer management systems, or quality assurance services, we have the unrivaled breadth of tools and expertise you need to confront any challenge head on.

Ultimate flexibility for your most complex processes

Your needs are unique, so we have a range of custom solutions across your workflow, including:

- Custom cell culture media
- Custom qPCR assays and master mixes
- Custom antibodies and immunoassays
- Custom gene synthesis
- Custom NGS panels for targeted sequencing
- Custom peptides
- Custom DNA oligos



Contract development and manufacturing organizations

Enabling you to be a single source for your customers

With your efforts to provide comprehensive services to pharmaceutical companies, from drug development through manufacturing, we understand you need to ensure regulatory compliance, efficiency, and quality in every process.

With Thermo Fisher as your partner, your customers can be confident that you're leveraging the latest scientific insights, top-notch materials, trusted experts, and cutting-edge technology to ensure the safety and efficacy of their product.

Helping to ensure the availability and quality of your products

From manufacturing to delivery, we are focused on ensuring assurance of supply. We do this by forecasting customer demand so manufacturing produces enough, protecting your products during shipping so they arrive as they should, and drawing on our extensive network of manufacturing and distribution sites so you receive your products when you need them.



Robust network

We have multiple manufacturing and distribution sites to help ensure your product supply.

- A network of 85 global manufacturing sites and 110 distribution locations
- Extensive collaboration across the network to help ensure we deliver on your requirements



Reliable distribution

We preserve product quality right up to your door.

- Product held close to our customers to minimize traveling distance
- Products are securely packaged to protect them when moving at speed
- Specialist carriers used where required
- Expertise in cold chain logistics



Consistent product supply

We do everything to permit efficient forecasting and planning to manage product availability.

- Extensive customer demand forecasting defines manufacturing quantities to enable product availability
- Collaborative planning across the network to ensure availability
- Availability to promise on customer orders, both pre- and post-order



Supply chain excellence

We ensure our supply chain is a competitive advantage, which our customers benefit from when they select us as a business partner.

- Continually strive to achieve process efficiencies that positively impact our service and exceed customer expectations
- Use real-time data to monitor our delivery to customers and make improvements
- Use advanced analytics to determine the required inventory investment





Services and support for instruments

Because science can't wait

There's no time for downtime in your lab. Built on more than 35 years of service expertise, our superior services and support solutions and applications help keep your lab up and running. More than 1,400 trained professionals make up the industry's largest network, ready to assist you when you need it. And smart features such as remote instrument services help keep you productive and focused on making the next discovery.

Learn more at [thermofisher.com/instrumentservices](https://www.thermofisher.com/instrumentservices)



Service plans

Maximize system uptime, reduce repair costs and turnaround time, extend the life of your instrument, and help keep it running at peak performance with one of our comprehensive service plans. Instruments covered by our on-site plans are prioritized in the repair queue, resulting in a 2x faster response time. Choose from a variety of service options that balance your budget, productivity, uptime, and regulatory requirements.

Explore service plans for your instrument at [thermofisher.com/instrumentplans](https://www.thermofisher.com/instrumentplans)

Get your instrument up and running 2x faster with our on-site service plans



2x faster response time



Save on repairs



Proactive instrument care



Easier instrument qualification

Because there's simply no time for instrument downtime

Our instrument service plans include digital innovations that help keep your instruments and your lab running smoothly. With pioneering on-demand tools and capabilities such as remote support using mobile augmented-reality (AR) technology, instrument-driven support, and on-demand instrument training, we're constantly looking ahead so your lab never falls behind.

Learn more about our digital service innovations at [thermofisher.com/innovations](https://www.thermofisher.com/innovations)

Not sure about your instrument's coverage status?

Look up your instrument's service history instantly when you visit [thermofisher.com/manage](https://www.thermofisher.com/manage)



Instrument hardware qualification services

Receive reliable, audit-style documentation to help you meet regulatory requirements and industry standards. Our manufacturer-trained and certified field service engineers will conduct comprehensive testing of your instruments using verified tests, certified tools, and developed standards to verify and document instrument performance.

Learn more or contact an instrument qualifications specialist at [thermofisher.com/iqoqpq](https://www.thermofisher.com/iqoqpq)



Analytical validation consulting services

Inefficient or ineffective analytical validation (AV) can be risky to a laboratory business, with substantial delays to test enablement costing a loss of reimbursement revenue. Our AV consulting services use industry standard practices to accelerate the process to testing samples, reducing the overall cost burden of validation, and providing objective evidence of the test performance for compliance. Let us handle the project management of your lab's AV, and your lab will successfully implement a new test up to 75% faster than by doing it yourself.

Get a complete list of assays and panels we support or contact an AV consulting services specialist at [thermofisher.com/av](https://www.thermofisher.com/av)



Computer system validation

Storing electronic records? Does your laboratory operate to GxP, CLIA, ISO, or other global regulations? If so, you may need to validate your computerized systems. Our computer system validation consulting service can enable you to meet global regulatory requirements for data integrity and help you reduce your compliance risk. Our validation professionals—working closely with your staff as validation project managers—can help you get into production faster, while at the same time, also allowing you

to control validation costs and manage your compliance risk with industry-accepted validation documentation.

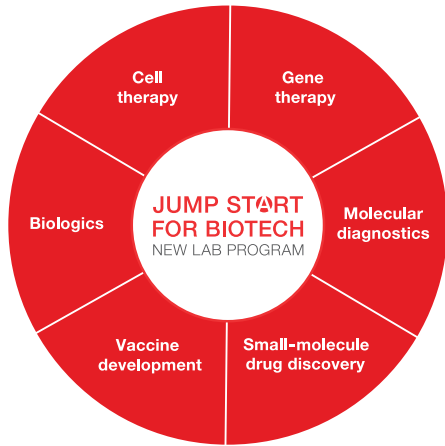
Learn more about validating your systems when you visit [thermofisher.com/csv](https://www.thermofisher.com/csv)



Education services

Help your team gain new skills or get up and running on new instruments faster. We offer a combination of virtual and in-person classroom instruction and hands-on learning in your lab to match your schedule, budget, and learning preferences. Whichever course style you choose, you'll learn from one of our 300 highly skilled applications scientists who are available to lead sessions online, at your location, or at one of our 12 global training centers.

Explore courses at [thermofisher.com/educationservices](https://www.thermofisher.com/educationservices)



Jump Start for Biotech: new lab program

Jump Start for Biotech is a free program created to get your new lab up and running with leading-edge products organized by therapeutic and diagnostic development workflows. Gain access to discounts and resources to leverage as you develop groundbreaking therapeutics and diagnostics.

Specialized products for end-to-end therapeutic and diagnostic development

The program includes resources designed for biotech companies:

- Webinars
- Brochures and checklists
- Learning centers
- Special discounts

You are eligible for the free program if you are:

- Opening a new lab within your institution or company
- Moving your lab to a new space
- Starting a new company
- Directed to the program by your sales representative

Find out more at thermofisher.com/biotechjumpstart



Resources

Biotech resources:

[thermofisher.com/biotech](https://www.thermofisher.com/biotech)

Jump Start for Biotech New Lab Program:

[thermofisher.com/biotechjumpstart](https://www.thermofisher.com/biotechjumpstart)

Laboratory essential products:

[thermofisher.com/biotechessentials](https://www.thermofisher.com/biotechessentials)

Coronavirus SARS-CoV-2 research solutions:

[thermofisher.com/coronavirus](https://www.thermofisher.com/coronavirus)

On-demand learning:

[thermofisher.com/connect2science](https://www.thermofisher.com/connect2science)

Services including custom manufacturing, consulting, and instrument services:

[thermofisher.com/services](https://www.thermofisher.com/services)

Life in the Lab industry magazine:

[thermofisher.com/litl](https://www.thermofisher.com/litl)

Cancer research resources:

[thermofisher.com/cancerresearch](https://www.thermofisher.com/cancerresearch)

Product documentation:

[thermofisher.com/support](https://www.thermofisher.com/support)



Find out more at thermofisher.com/biotech

For Research Use or Manufacturing of Cell, Gene, or Tissue-Based Products. © 2021 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries unless otherwise specified. Luminex is a trademark of Luminex Corp. TaqMan is a registered trademark of Roche Molecular Systems, Inc., used under permission and license. **COL34509 1121**